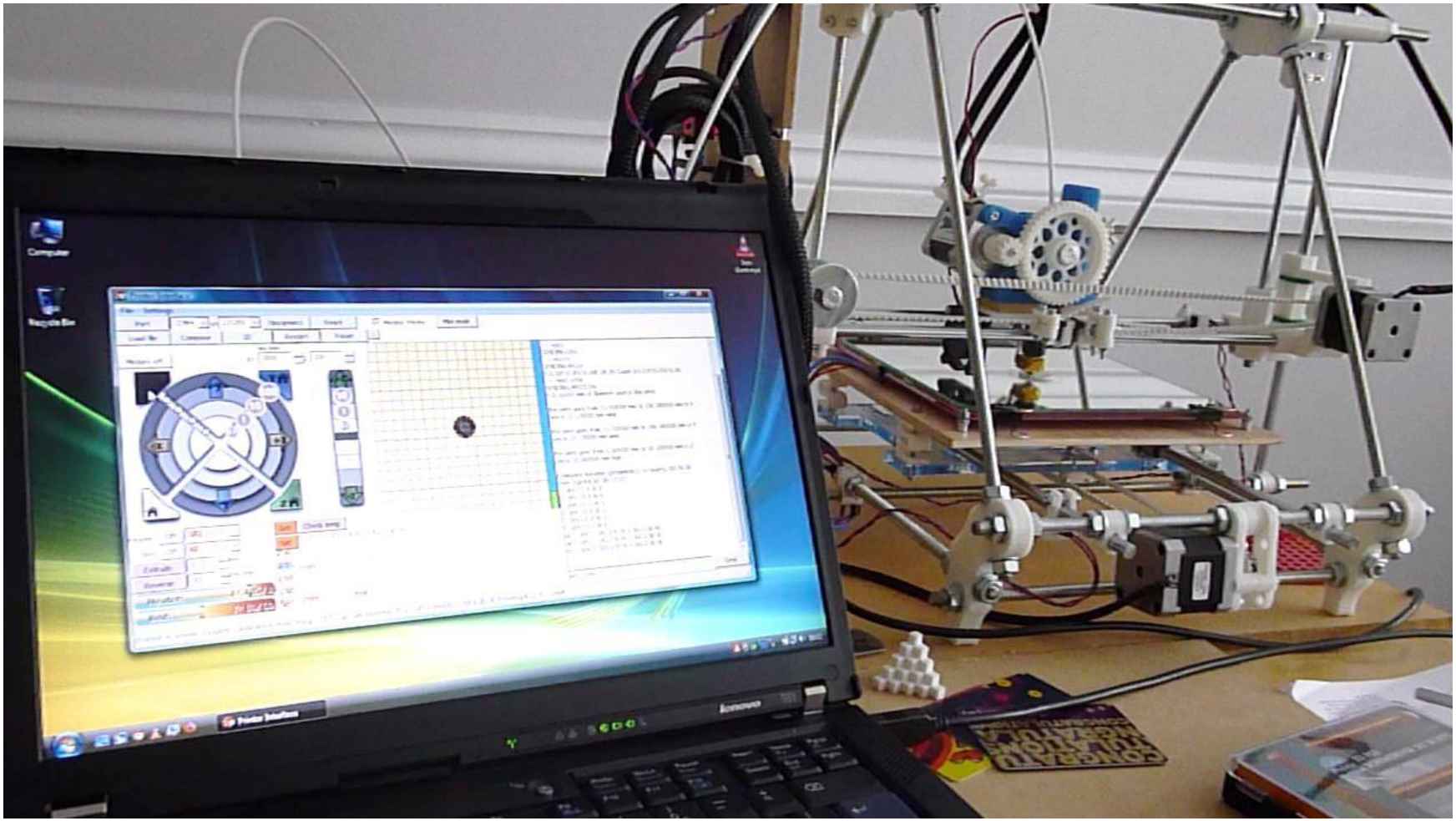
Thames Valley Reprap User Group (TVRRUG)



David Price

© copyright May 2014 D Price

TVRRUG

Hannah and **Malcolm Napier** laboured to get a working printer in 2006 then 2010. Inspired by a 2011 presentation by Adrian Bowyer they built a working Mendel and presented at RDGGeek and OggCamp 11 in Farnham.

TVRRUG founded 2011 by Malcolm & Hannah, Mike Beardmore together with Al Wood & Hugo Mills with inaugural meeting at the Copa Bar in Reading.

Aim: **produce a low cost home buildable machine that produces decent prints with minimum calibration. A community to support builders and encourage development**

- TVRR = **Modified existing open source design** (Prusa Mendel)
  - Josef Prusa modified the open design by Adrian Bowyer and his group at Bath University
  - Designed and implemented more robust open-source electronics
- Round 1 (2011) 22 builders, parts printed by Hannah & Malcolm plus two others, some then printed parts for …
- Round 2 (2012) 25 builders, some then printed parts for …
- Round 3 (2013) 19 builders, including three schools

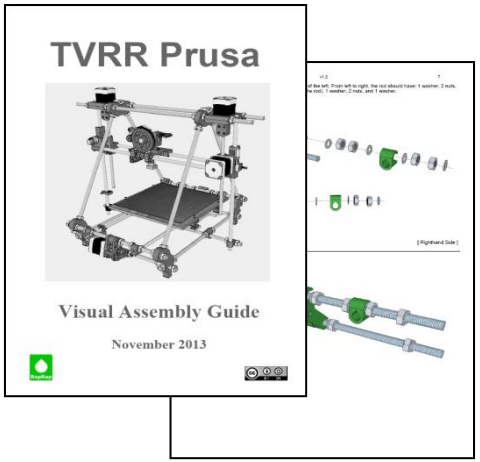
66 kits, of which ~50 built and working plus 10 members with non-TVRR printers

- Not just the Thames Valley – members around UK and in Denmark, Sweden, Brazil, Serbia, France and US (Denver & California)
- Website and Google Group, fairly regular meetings (2 per month) at rlab, Google hangout and IRC.
- No membership fee but cost of printer included a donation to Hackspace of builder's choice
- In Development – Mendel90, Delta printers, Multiple extruders, electronics package

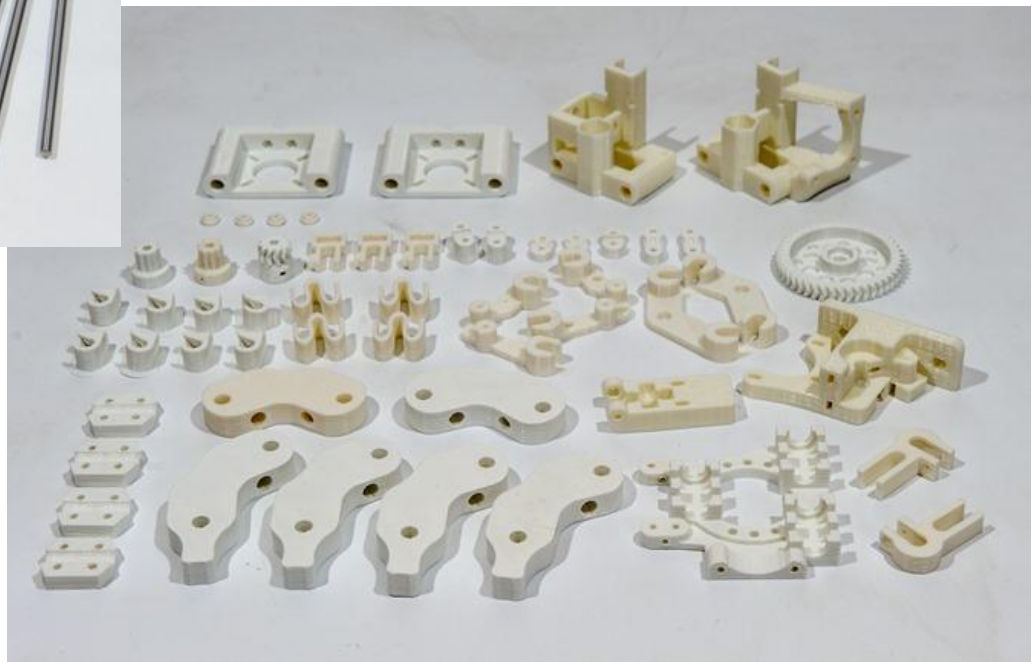
© copyright May 2014 D Price

The TVRRUG Prusa Mendel 3D Printer as a kit

Motors
Electronics
Fixings
Rods
Bearings
Build guides



And ..



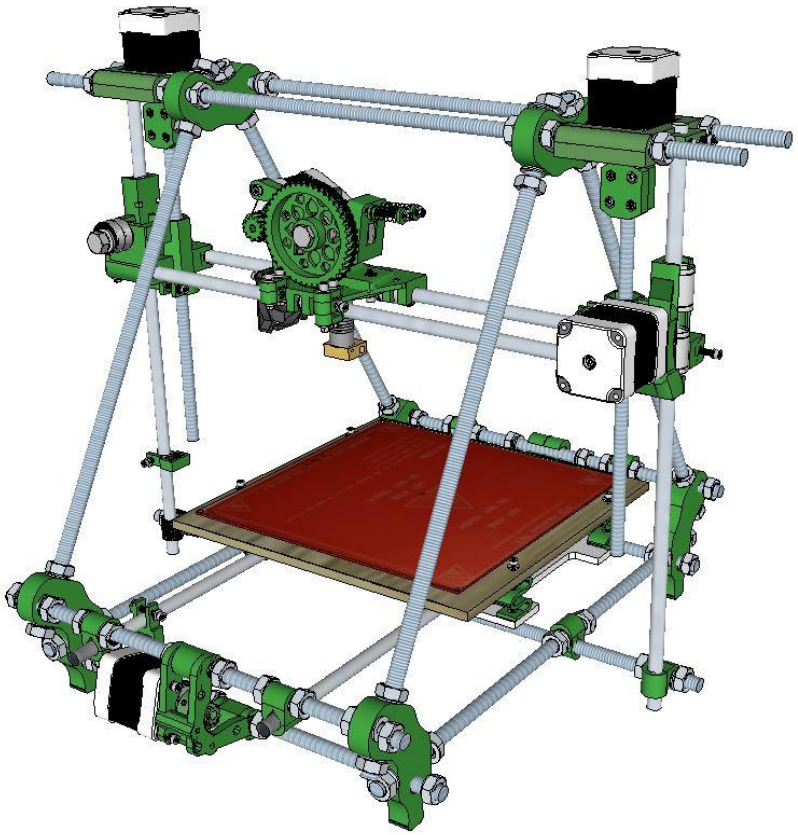
.. Set of plastic parts printed on someone else's printer

55m filament, 30 hrs printing

© copyright May 2014 D Price

- Desktop prototyping and short run production
- Open source hardware and software
  - Mechanics (Reprap Prusa Mendel based)
  - Electronics (OMC & DSM in Solderpad repository)
  - Software (Marlin, Slic3r, Printrun, OpenSCAD, SketchUp)
- Print replacement parts - Self repair and upgrade
- Build time 24 - 30 hours

$3 versus $30



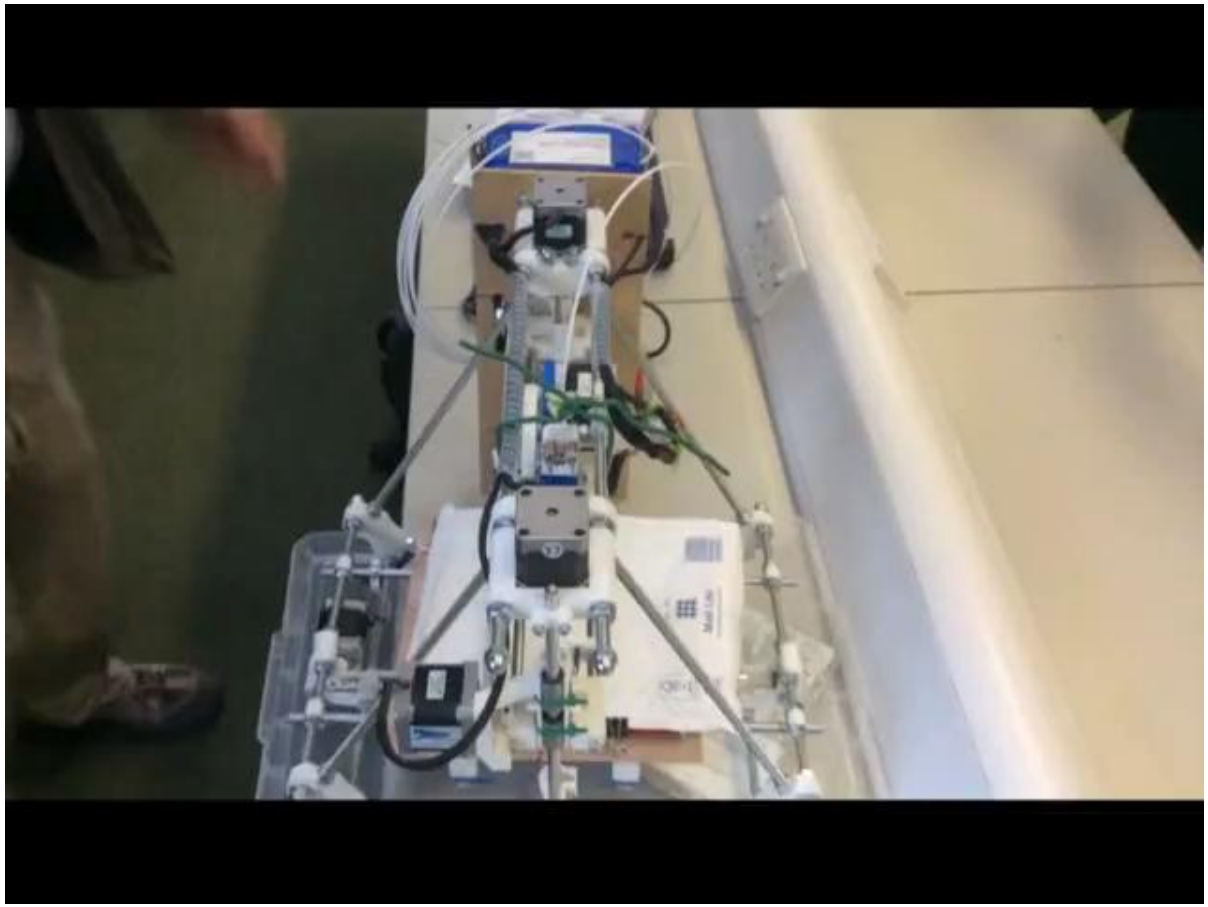
Additive Manufacturing Process
FDM (Filament Deposition Modelling)
Size
480mm (W) x 440mm (D) x 400mm (H)
Build envelope
200mm (W) x 200mm (D) x 100mm (H)
Accuracy
Nozzle diameter: 0.4mm
Positioning: 0.1 mm (100 micron) or better
Layer thickness: < 0.3 mm
Feature: layer height x approx 0.4mm XY
Material
3mm PLA filament (£18-35 per metre)
ABS, Nylon, HDPE, rubber, PET, ceramic, sugar … Chocolate
Speed
X motor bracket - 200 minutes and 5m of 3mm PLA
Power
240v 3A
Interface
USB serial to Arduino based controller

© copyright May 2014 D Price

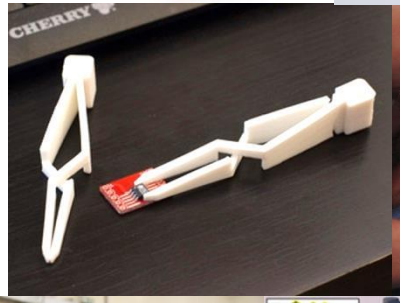
Schools:

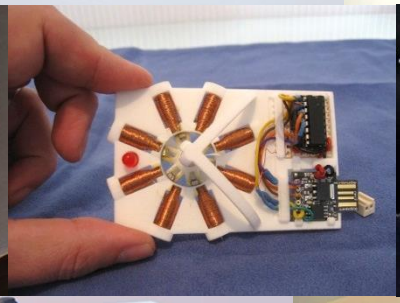
- Easthampstead Park Community School, Bracknell
- Desborough College, Maidenhead
- Harrow Way Community School, Andover

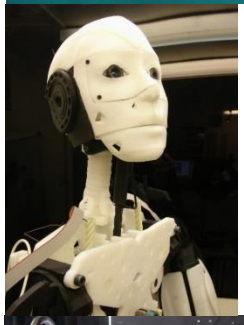
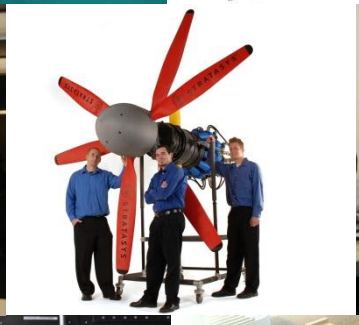
Over 13 weeks a small group of students (8-10) build a printer, learn to operate it, design objects with SketchUp and print them - bumper case for a Nexus 7, micro vase to hold water and a daisy for Mum, show other schools how to do it, print stuff for charity…..



© copyright May 2014 D Price

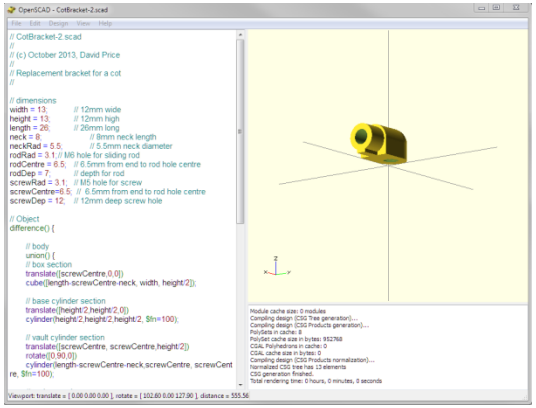


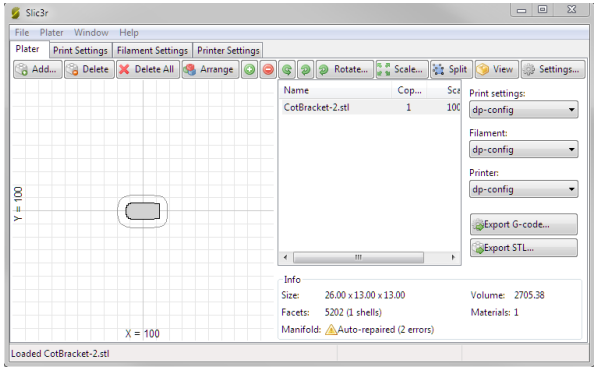


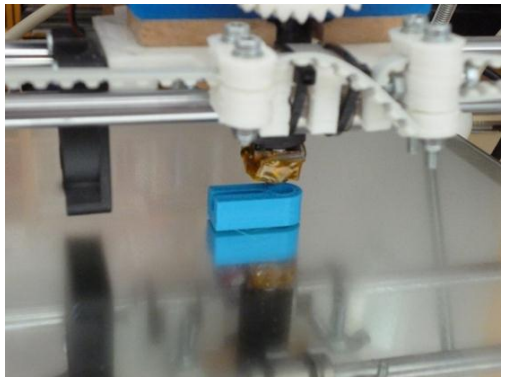



© copyright May 2014 D Price

Maker-Fixer Workflow





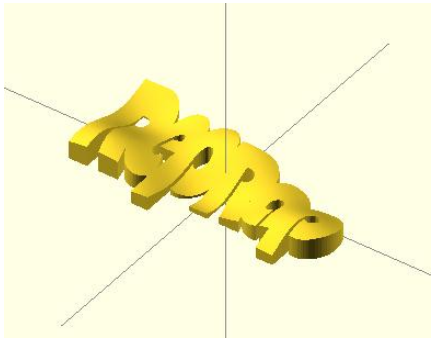


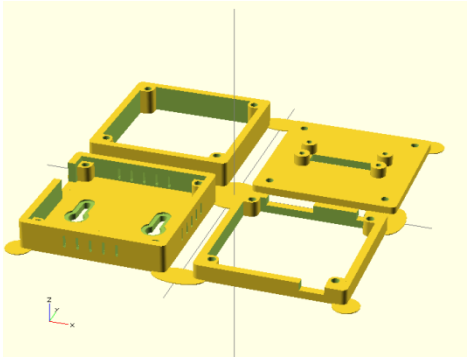
£5 fix vs £250 for new cot
(excludes design effort)

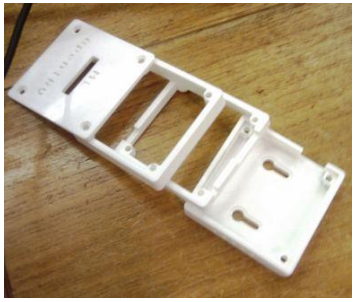
© copyright May 2014 D Price

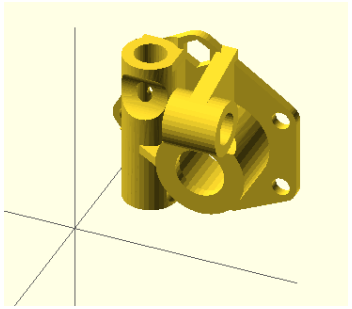
Also,

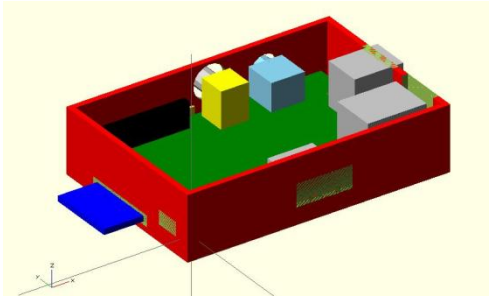
- Numerous Teen Tech challenge sessions
- Mini Maker fairs in London and Brighton
- Radio Rallies and Computer Fairs
- Reading FSB awareness session for small businesses
- Supported OpenTRV open source project
- SMEX 2013 exhibits
- Intro to 3D Printing and Scanning workshops at South Hill Park, Bracknell











Future = more of the same, in plastics, chocolate, clay, concrete …

© copyright May 2014 D Price

TVRRUG
Tvrrug.org.uk
Google group: tvrrug

David Price
daprigoo@googlemail.com

© copyright May 2014 D Price